Message

**From:** Harshfield - CDPHE, Gregory [gregory.harshfield@state.co.us]
**Sent:** 10/9/2015 4:55:43 PM
**To:** Payton, Richard [Payton.Richard@epa.gov]
**CC:** Gordon Pierce [Gordon.Pierce@dphe.state.co.us]; scott.landes@state.co.us
**Subject:** Re: FW: CDPHE Colorado Mines ozone Monitor
**Attachments:** removed.txt; Mines 06012015 to 07192015.xls

See attached. You will have to make a judgment call on some of the data. Definitely ignore data with a "D" flag (that means the data logger was manually disabled). Be cautious with the "C" flag. The "C" flag means a calibration was run during that hour. If the data was being flagged as invalid during the calibration, then the calibration values will be Incorporated into the hourly average. The analyzer reported an average +8.4% bias for the time period. Meaning you should reduce the reported value by approximately 8.4%. The variability of the QC results were quite small.
Greg

On Fri, Oct 9, 2015 at 10:31 AM, Payton, Richard <Payton.Richard@epa.gov> wrote:

> I would like to see it, just to compare to the low elevation exceedance days. I will correct it and not share out the raw data.
>
> Richard
>
> **From:** Harshfield - CDPHE, Gregory [mailto:gregory.harshfield@state.co.us]
> **Sent:** Friday, October 09, 2015 10:29 AM
> **To:** Payton, Richard
> **Cc:** Gordon Pierce; scott.landes@state.co.us
> **Subject:** Re: FW: CDPHE Colorado Mines ozone Monitor
>
> Richard,
>
> The analyzer was indeed operating during this time period but it failed our nightly QC because of a bad calibration. During this time period, the analyzer reported no data between 6/5 and 6/11 because of a communication problem between the analyzer and the data logger. We have data for the remaining time period, however it is biased approximately 8% high. I could send you the data with the caveat that you may want to consider correcting it based upon our nightly QC.
>
> Greg
>
> On Fri, Oct 9, 2015 at 10:04 AM, Payton, Richard <Payton.Richard@epa.gov> wrote:
>
> > Greg: I sent the below to folks in my program to introduce them to Mines Peak.

I notice in AQS that there is a data gap from June 3 to July 18 of this year. Was the monitor not operating in that period? That was a particularly complex time, with some days showing stratospheric intrusion potential, and with smoke in the area on some days. June 20 and 21 are particularly interesting. I pulled the NOAA data for Niwot Ridge to compare it to the Mines Peak data. On June 20, Niwot ridge had higher 1-hr O3 than any CDPHE site, so I was interested in seeing if Mines Peak was as high as Niwot Ridge, if there is data from Mines Peak on that day.

Thanks for arranging my visit to the Peak with Phillip.

Richard
(303) 312-6439

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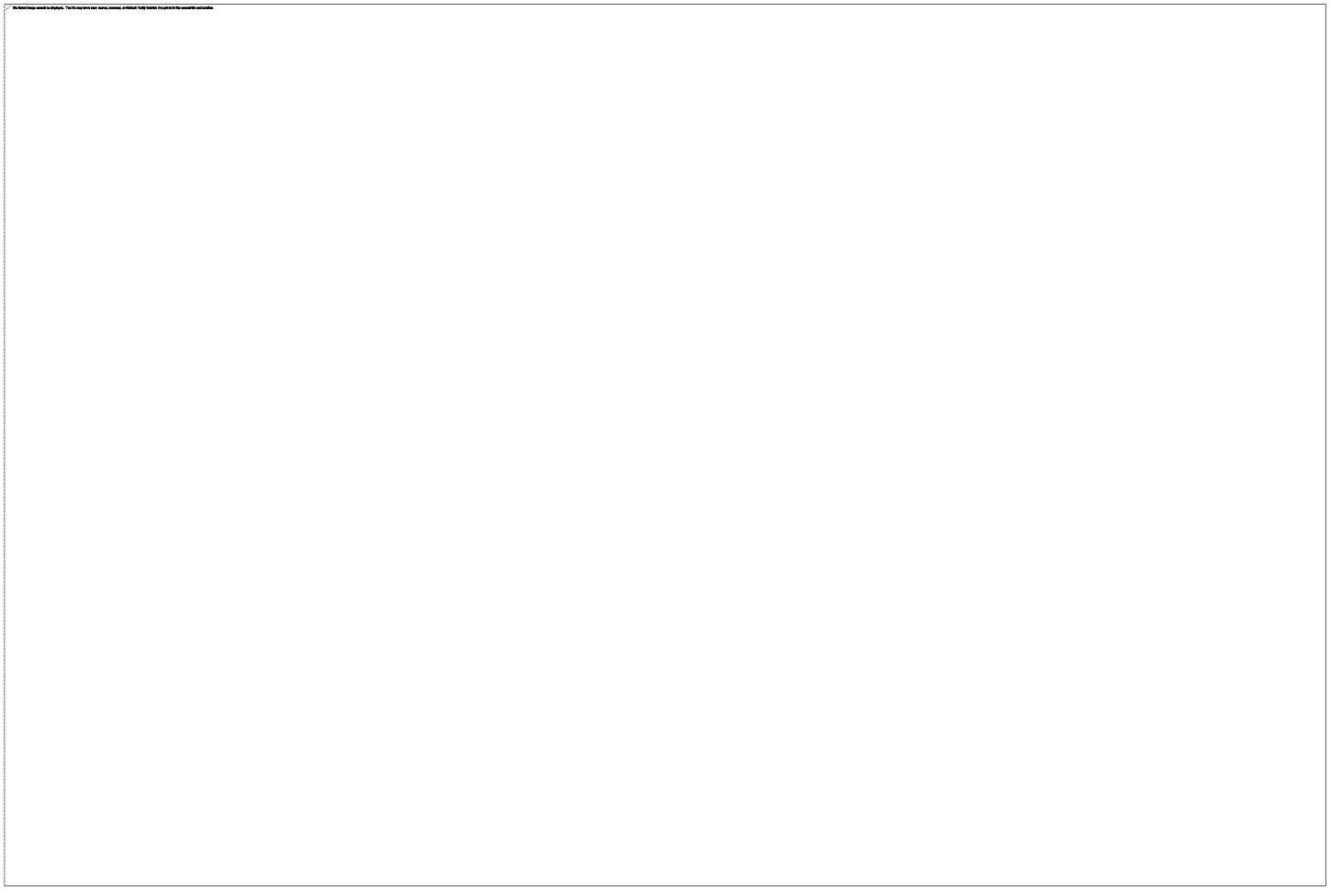
**From:** Payton, Richard
**Sent:** Friday, October 09, 2015 9:53 AM
**To:** Tonnesen, Gail; Matichuk, Rebecca
**Cc:** Ostendorf, Jody; Rothery, Deirdre; Jackson, Scott; Carlson, Albion; Rickard, Joshua; Daly, Carl; Adam Eisele
**Subject:** CDPHE Colorado Mines ozone Monitor

CDPHE had been operating and ozone monitor at the top of Colorado Mines Peak (Berthoud Pass) since July of last year.

The monitor is in a radio shack operated by the State of Colorado. The Mines Peak monitor is at 12,490 feet, about 1,100 feet above Berthoud Pass. The radio shack is a cinderblock building, heated only by the microwave transmitters and data management equipment it houses and a Ford 4-cylinder propane emergency generator. There API 400 ozone monitor is rated for operations from 5 ° to 45°C, but the shelter temperature is not guaranteed to stay in that range. The only access to the monitor is via snow cat from around November to mid-June, so CDPHE is not able to maintain required Quality Assurance and calibration year round at the site.

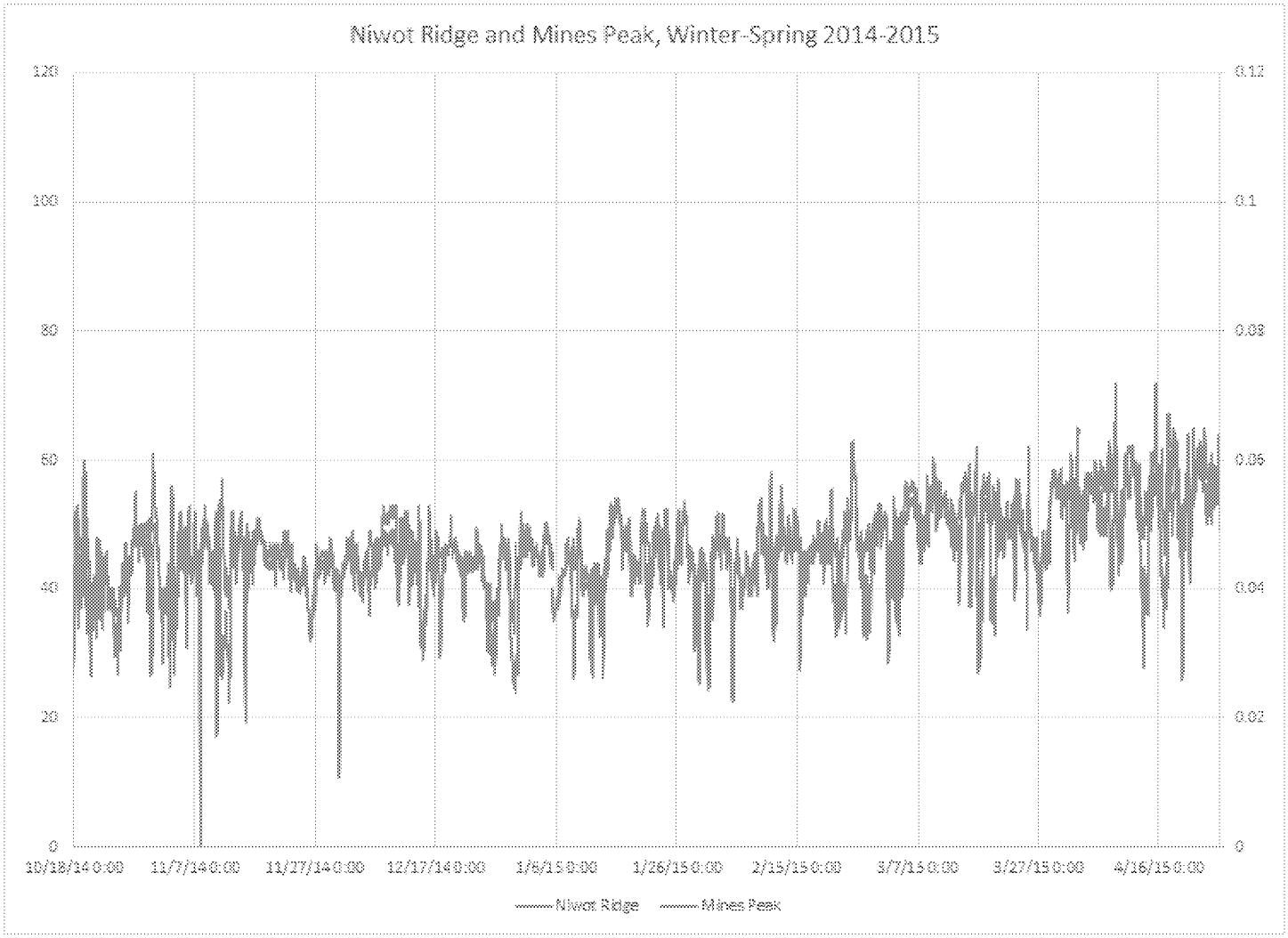
I was able to visit the Mines monitor on Tuesday, and Colorado loaded the July 2014-July 2015 data into AQS on Wednesday. Because of the lack of year round access and lack of shelter environmental control, they asked that data from the site be excluded from NAAQS comparison, and I provided concurrence on that request in AQS.

Berthoud Pass from Mines Peak

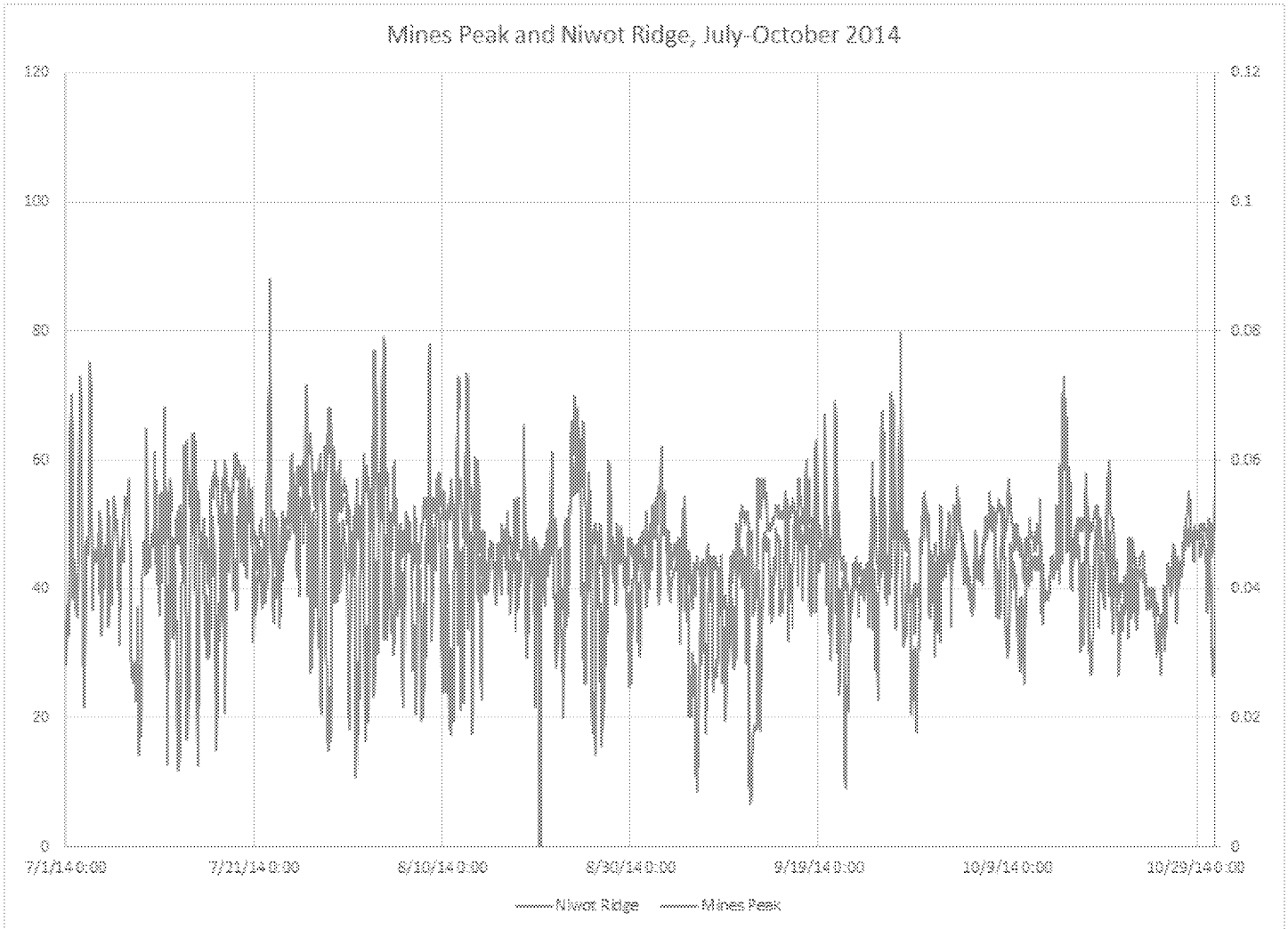


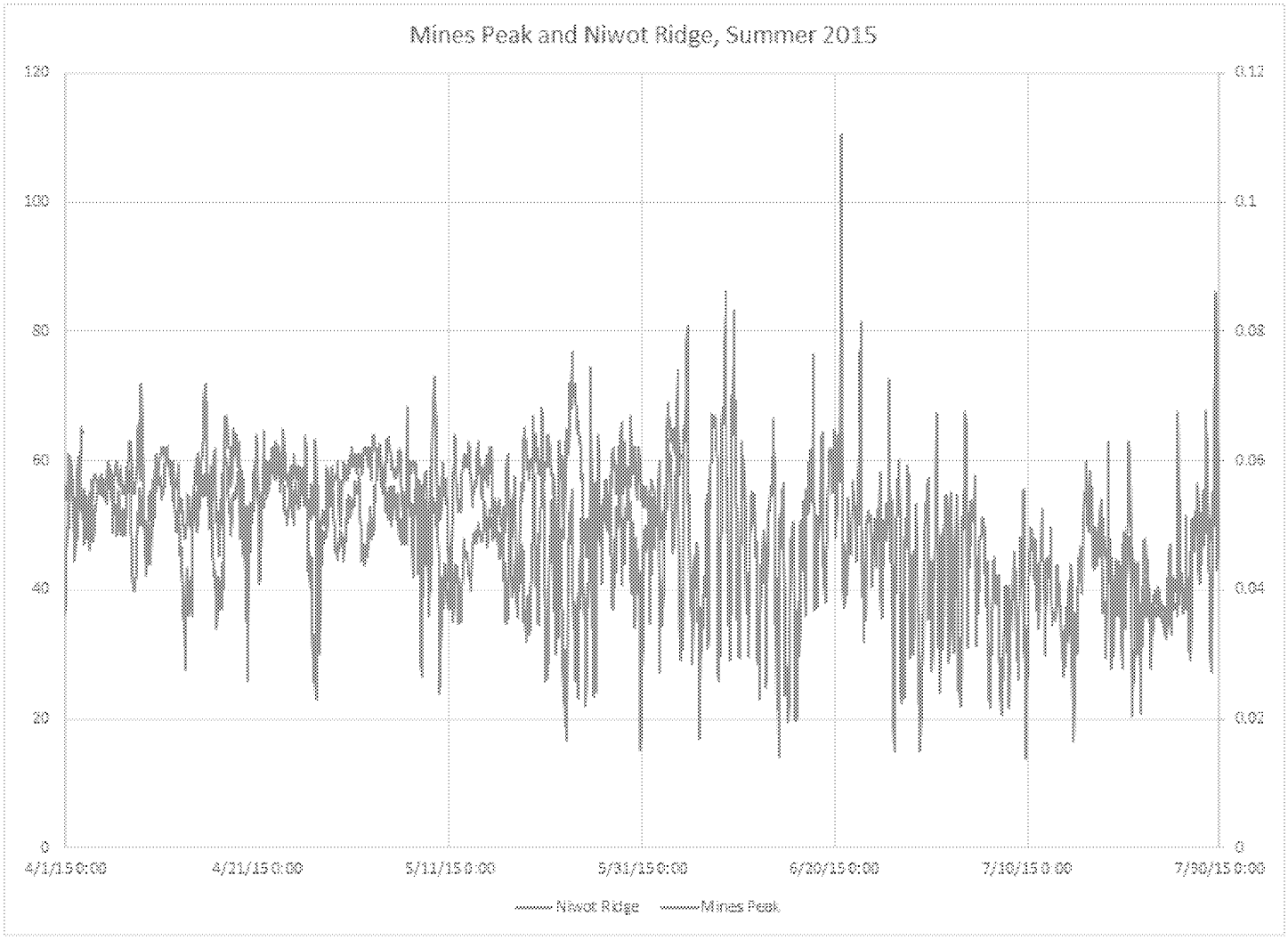
To look at the uniqueness of the Mines Peak data, I pulled contemporaneous data from the NOAA Niwot Ridge monitor. Niwot ridge is 20 miles NNE of Mines Peak, and, at 11,573 feet about 900 feet lower.

For the winter months, Niwot Ridge Saddle/Tundra data and Mines Peak have very good agreement; the most obvious difference in the two is that Niwot Ridge tends to drop to lower values overnight than does Mines Peak.

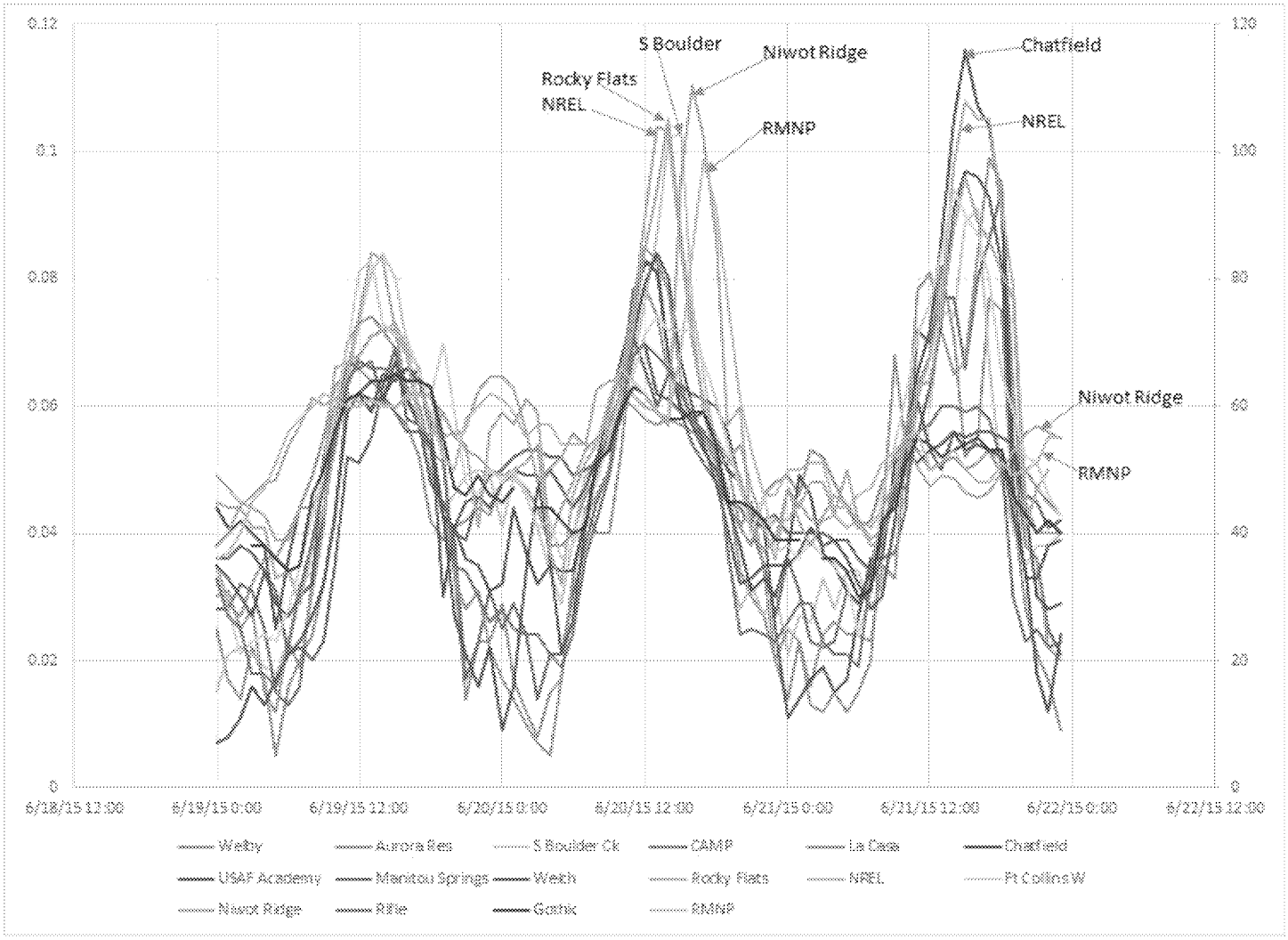



From mid-April to October, however, the two sites are in much poorer agreement; Niwot ridge is generally somewhat lower than Mines Peak, and has much more nighttime ozone decreases than does Mines Peak. Niwot ridge is 3 miles east of the Continental Divide, and a straight 16 mile shot up Four Mile Canyon from Boulder. Mines Peak is on the Divide, and is a meandering 30 miles up Clear Creek Canyon from Golden. Niwot Ridge therefore has a much more direct path for urban NOx to move up valley in the afternoon and lead to nighttime titration of ozone.


Mines Peak and Niwot Ridge, July-October 2014
120
100
80
60
40
20
0
0.12
0.1
0.08
0.06
0.04
0.02
0
7/1/14 0:00
7/21/14 0:00
8/10/14 0:00
8/30/14 0:00
9/19/14 0:00
10/9/14 0:00
10/29/14 0:00
Niwot Ridge
Mines Peak




The big ozone spike on June 20, 2015 is of interest; right now, no data is available in June for Mines Peak (I will check with CDPHE to see if it exists.) Niwot Ridge had higher ozone than any CDPHE monitor on that day, but, it peaks after the Denver urban monitors; that is more likely to be the urban plume moving upslope than stratospheric ozone, even though the highest ozone is at the highest site. The next day, both Niwot Ridge and RMNP are very low, even though Denver ozone is even higher than the previous day. These were smoky days this year. Having Mines Peak to compare to the Niwot and Denver data on these days should rule out stratospheric O3, if the data does not show a spike like Niwot's.




Long term, we expect Mines Peak to be a valuable diagnostic of stratospheric intrusions.

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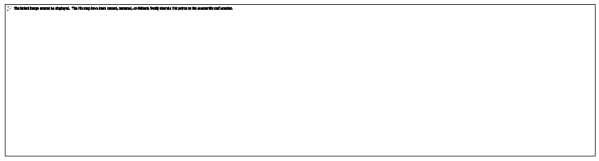
Gregory Harshfield
Gaseous and Meteorological Monitoring Group Supervisor
Technical Services Program



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gregory.harshfield@state.co.us | www.colorado.gov/cdphe/apcd

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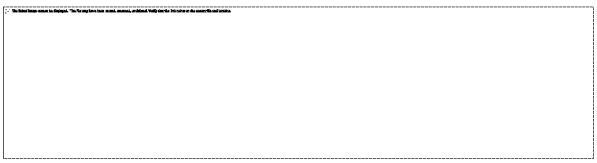
**Gregory Harshfield**
**Gaseous and Meteorological Monitoring Group Supervisor**
Technical Services Program



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